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Federal Communications Commission
Office of the Secretary

Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, DC 20554

In the Matter of	)	
	)	
Revision of Part 22 of the Commission's Rules Governing the Public Mobile Services	)	**CC Docket No. 92-115**

To: The Commission

REPLY COMMENTS

Motorola Inc. is pleased to submit the attached reply comments in the proceeding captioned above.

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November 5, 1992

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REPLY COMMENTS

1. In this Proceeding, the Commission has sought comment on a broad array of technical, licensing and related regulatory issues. The commenting parties have submitted filings which reflect their respective areas of expertise and the impact of the various proposals on the parties' particular business or regulatory perspective. The instant reply comments will focus on certain technical issue which are equipment related.

ELECTRONIC SERIAL NUMBERS

2. Under Section 22.919 of the proposed rules, the Notice of Proposed Rulemaking ("NPRM") sets forth regulations on the accessibility of the Electronic Serial Numbers ("ESNs") of mobile units. Among other things, the proposed rule requires that a mobile transmitter have a "unique" ESN. It is also proposed that the ESN may not be "manipulated in the field.

3. Motorola supports the basic intent of the proposed rule, which is to prevent fraud. The Commission is to be commended in seeking to facilitate the extensive efforts which

have taken place within the industry for some time to detect and prevent fraudulent practices involving mobile units.

4. In its comments, CTIA supported the proposal and offered certain clarifying language, designed to remove perceived ambiguities in the proposed rule language. Along similar lines, Motorola hereby submits additional discussion and proposed language to expand on the subject.

5. The practice of assigning "unique" ESNs is a key element in the operation of cellular radiotelephone systems and is the first line of defense against cellular industry's fraud and theft of service. ESNs also provide other valuable functions which users demand. An important example is the transfer of ESNs in cases where a subscriber's cellular handset fails to operate. Today, when this occurs, the user need not experience service interruptions or delays, because it is possible to provide the user with a replacement handset almost immediately, provided that the electronic circuitry that has failed does not, for some reason, prevent the ESN from being transferred. Motorola has such a program in place, and it has been positively accepted by a number of cellular service providers, as well as by the cellular user public.

6. If ESNs were <u>not</u> permitted to be so readily transferred, the user whose handset became damaged or defective would be required to coordinate with the cellular service provider to reprogram the cellular switch so a different ESN (from the replacement phone) could be used with the subscriber's service and phone number. In the alternative, the subscriber would be required to wait until the original handset could be repaired and returned.

7. Motorola strongly supports all fraud detection programs and has worked diligently with the carrier members of the industry to eliminate these abuses. The ESN transfer practices described above do not undermine fraud detection or prevention. Indeed, the equipment certification program currently operated by CTIA permits these ESN transfer procedures.

8. Proposed clarifying language: Unique ESNs and ESN transfers can both be accommodated, in a manner which is fully consistent with fraud prevention while permitting these other important flexibility options demanded by the public. As an alternative to a flat prohibition on ESN transfers, we propose the following policies (which are consistent with what is currently being done in the field):

(1) a secure means of ESN transfer must be provided so that during the transfer process, the ESN is not in any way available in an unencoded form and may not be altered or manipulated;

(2) a duplicate ESN may not be created as a result of the transfer process;

(3) the mobile transmitter that serves the source of the transferred ESN may not be operative following the transfer of its ESN.

9. Future technology: flexibility in Rule Section 22.919: Motorola further suggests the addition of certain clarifying language which will make the rule more consistent with technologies currently being used and which will permit anticipated advances in manufacturing technologies of the future. None of these proposed revisions will undermine in any way the basic intent of the rule, to detect and prevent fraud.

10. Proposed Subsection 22.919 (b) refers to permanent attachments to a main circuit board of the mobile transmitter. We suggest the addition of the term "such as by soldering." Attachment by soldering is a method commonly, though not exclusively, used by manufacturers of mobile transmitters. This clarification will eliminate any possible doubt as to whether this manufacturing technique is considered suitably "permanent" to comply with the rule. The language is also flexible enough to allow for other future attachment methods which may be adopted in the future.

11. Proposed Subsection 22.919 (b) further refers to the integrity of the mobile unit's operating software and prohibits its being altered. Motorola suggests that the prohibitory language be modified to specify that the software may not be "externally alterable." The software safeguards which can be achieved do not relate to the internal electronic components of the mobile transmitter. As a practical matter, it is virtually impossible to guarantee that the mobile transmitter's operating software could not be compromised if the unit were opened. The proposed revision will make the rule consistent with current (and future) fraud prevention measures.

12. Repair and upgrades of subscriber equipment: Proposed Subsection 22.919 (c) has the commendable intent of prohibiting the removal or tampering of ESNs in the context of fraud. We suggest clarifying language which will, at the same time, leave flexibility in the rule so that legitimate repairs or upgrades of equipment may still be carried out.

PROPOSED RULE SECTION 22.919

#22.919. Electronic Serial Numbers.

The Electronic Serial Number (ESN) is a 32 bit binary number that uniquely identifies a cellular mobile transmitter to any cellular system. Each mobile transmitter must have a unique ESN and must comply with the following specifications.

(a) The ESN must be factory set and must not be alterable, removable or otherwise able to be manipulated in the field. An ESN may be transferred in the field provided that the following criteria are met:

(1) A secure means of transfer is provided so that during the transfer process the ESN is not in any way available in an unencoded form and may not be altered or manipulated;

(2) A duplicate ESN is not created as a result of the transfer process;

(3) The mobile transmitter that serves the source of the transferred ESN is not operative following the transfer of its ESN.

(b) The ESN host component must be permanently attached to a main circuit board of the mobile transmitter, such as by soldering, and the integrity of the unit's operating software must not be externally alterable. The ESN must be isolated from fraudulent contact and tampering. If the ESN host component does not contain other information, that component must not be

removable, and its electrical connections must not be accessible. If the ESN host component contains other information, the ESN must be encoded using one or more of the following techniques:

(1) multiplication or division by a polynomial;

(2) cyclic coding;

(3) the spreading of ESN bits over various non-sequential memory locations.

(c) Cellular mobile equipment must be designed such that any attempt to remove, tamper with, or change the ESN host component will render the mobile transmitter inoperative. The equipment must also be designed such that any attempt to remove, tamper with, or change its logic system or firmware, other than upgrades approved by the manufacturer, will render the mobile transmitter inoperative. The above prohibitions are not intended to prevent legitimate repair of cellular mobile equipment.

13. Grandfathering existing equipment. Several commenting parties suggested that the rules should grandfather ESN arrangements made on existing equipment. Motorola supports this suggestion. Although there is the downside that fraud and service theft will remain more of a possibility while existing equipment remains in the field, the costs and other burdens of mandating the retrofitting of all existing equipment would not be justified. The effect of the proposed ESN rule should be prospective. Whatever effective date is ultimately selected should be based on close coordination with service providers, users, and equipment suppliers to ensure a smooth transition while supporting the industry's priority efforts to prevent fraud.

14. Microcell technology and regulation. In its comments, Southwestern Bell Corporation (SBC) provides a detailed discussion of microcells and proposes several definitions and modifications relating to this developing cellular technology. In general, Motorola supports the intent of the suggested language but offers the following observation. Microcell technology will have far broader application than cellular, potentially extending into the entire family of PCS and other emerging mobile technology services. Moreover, there may be broad licensing policy issues which should be examined. For example, some microcell systems may be regulated under the common carrier umbrella while others may be licensed as private systems. Still other microcell systems may be permitted to operate as non-licensed systems. A number of these microcell-related issues may go beyond the technical stage and could be broader than the scope of the instant Rule Making to update Part 22. The Commission may wish to examine some of these microcell issues within the context of one or more related proceedings and to consider the SBC comments as an important part of a full blown examination into various microcell issues.

CERTIFICATE OF SERVICE

I, Alice M. de Séve, of Motorola Inc., do hereby certify that on this 5th day of November, 1992 a copy of the foregoing "Reply Comments" was sent to each of the following by first-class mail, postage-prepaid except where service by hand is indicated(*):

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